REMARKS

In accordance with the foregoing, the claim **1** has been amended, the claims **4-15** and **17-25** have been canceled and new claim **26** has been added. Therefore, claims **1-3**, **16** and **26** are pending and under reconsideration, which is respectfully requested.

ITEMS 4-6: REJECTION OF CLAIMS 1, 3, 16, 18-20, 22 AND 25 UNDER 35 U.S.C. 103(a) AS BEING UNPATENTABLE OVER TURBAK ET AL (US PATENT NO. 4483743) OR BATTISTA (US PATENT NO. 3146168) IN VIEW OF KOCH ET AL (WO 99/02568) OR BUNICK ET AL (US PATENT NO. 4714620).

Claim **1** has been amended to recite no entanglement between fibers. Antecedent basis can be found at page 70, line 4 of the specification. In addition amended claim **1** recites that the cellulose has substantially no branched bundles of fiber. Antecedent basis can be found at page 21, lines 16-19 of the specification. New independent claim **26** is similar to previous claim **1**, but recites 30% by weight or more of a component stably suspensible in water after being centrifuged at 1,000 G for 5 minutes. Antecedent support for this limitation can be found, for example, at page 14, lines 2-16 of the application.

1. Arguments against **Turbak et al.**

The Examiner cites **Turbak et al.**, based on a belief that it forms a substantially stable suspension. **Turbak et al.** discloses (see column 3, lines 28-32) that "substantially stable suspension" means a suspension in water which upon dilution to 0.5% and upon standing for one hour, contains no more than 40% of clear liquid.

In contrast, the term "component stably suspensible in water" used in the present application means a component which is stably suspended in water without sedimentation, even when it is made into an aqueous dispersion having a concentration of 0.1% by weight and the resulting dispersion is centrifuged at 1,000 G for 5 minutes, as described at page 14, lines 2-10 of the specification. New independent claim **26** recites this feature.

The measurement conditions of suspension stability described in the application are more severe than those of **Turbak et al.** Thus, if the cellulose disclosed in **Turbak et al.** is measured by the method disclosed in the application, most of the cellulose will precipitate, and thus the cellulose disclosed in **Turbak et al.** does not satisfy the feature of the present invention "the water-dispersible cellulose comprising 30% by weight or more of a component stably suspensible in water."

The Applicants submit a **Declaration** attached herewith to emphasize this point. The Declaration is made by, Ms. Yurika Yagi, who is identical to Ms. Yurika Tanaka, one of the inventors of the present invention. That is, the inventors name changed due to her marriage.

As shown in the **Declaration**, the Applicants produced the microfibrillated cellulose according to the method disclosed in Example 1 of **Turbak et al.** (i.e. the method of conducting 11 passes through a Manton-Gaulin homogenizer at 8000 psi (about 55 MPa)). The resulting microfibrillated cellulose was measured using the method disclosed in the specification (i.e. the measuring method of preparing a 0.1 % aqueous solution, and then analyzing "the component stably suspensible in water" under the conditions of a centrifugation at 1,000G for 5 minutes). As a result of these tests, it was determined that "the component stably suspensible in water" was 15%. Therefore, it is apparent that the microfibrillated cellulose disclosed in **Turbak et al.** does not satisfy the requirement for "the water-dispersible cellulose comprising 30% by weight or more of a component stably suspensible in water."

The cellulose disclosed in **Turbak et al.** has many tangles between the fibers, whereas the present invention of claim 1 does not. This difference can be understood by comparing Figs. 3-5 of **Turbak et al.** (or the clearer Figs. 3-5 of the attached copy of JP-B-63-44763 which is a counterpart of **Turbak et al.**) with the attached SEM photograph of the product of the present invention. In this connection, as disclosed in **Turbak et al.**, Fig.3 shows raw material pulp fibers, Fig.4 shows microfibrillated fibers after 5 passes, and Fig.5 shows microfibrillated fibers after 20 passes. It should also be apparent that the fibers of Figs. 3-5 are thicker than those shown in SEM example shown in the photograph. However, the specific thickness of the fibers is not disclosed in the **Turbak et al.** patent documents (USP 4,483,743, related US patent 4,374,702, and counterpart JP-A-61-215601).

Turbak et al. achieves good suspension stability when a 0.5% concentration of the cellulose is subjected to the normal attraction of gravity. The **Turbak et al.** cellulose would not be able to maintain a good suspension if diluted state to a 0.1% concentration and a centrifuged at a force of 1,000 G for 5 minutes.

In contrast, since the microfibrillated cellulose of the present invention has a length of 0.5-30 μm and a width of 2-600 nm and a length/width ratio of 20-400, i.e. the cellulose is micronized to a slender single fiber shape, good suspension stability can be achieved. The suspension stability of the present invention is far superior to that of **Turbak et al.**

Meanwhile, **Turbak et al.** discloses (at claim 1 and column 2, lines 16-17) a "water retention value" as a property of the cellulose. The "water retention value" means that pulp fibers can retain water. **Turbak et al.** discloses water retention data at Example 4 (Table I) and at Example 6 (Table III). The water retention tests were conducted by allowing an aqueous cellulosic suspension to drain in a cup with a perforated bottom, centrifuging for ten minutes and removing and weighing the cellulosic sample. After drying, the water retention values were determined based on the dry weight of the sample (see column 5, lines 38-48 of **Turbak et al.**).

When a numerical value for water retention can be obtained for fibrous cellulose, this indicates that the cellulose is pulp fiber and has entanglement between fibers (see Figs.3 to 5 of **Turbak et al.**).

In contrast, the cellulose described in the present application is highly fiber-shortened and micronized, and thus does not substantially have branched bundles of fiber. Thus, if the **Turbak et al.** test were performed on the present invention, substantially all of the cellulose of the present invention would pass through the perforations at the bottom of the cup, or the perforations would become clogged. Thus, it would likely not be possible to perform the **Turbak et al.** test or obtain a water retention value. See page 18, line 10 to page 19, line 2 of the specification.

In view of the foregoing, it should be clear that the cellulose of the present invention is quite different from the cellulose **Turbak et al.**

The method of producing the cellulose of the present invention is described at page 29, line 6 to page 35, line 9 of the specification. The claims are not limited to the method. However, (2) fiber-shortening and micronization of cellulose fibrous particles and (3) high pressure homogenizer treatment are important. A cellulose having a good suspension stability can be obtained by fiber-shortening and micronizing cellulose fibrous particles using these two steps. However, the method of fiber-shortening and micronization of cellulose fibrous particles is just one example. The method of fiber-shortening and micronization cellulose fibrous particles is certainly not limited to the method described at the present specification

2. Arguments against **Batista**.

Batista discloses "cellulose crystallite aggregates" obtained by hydrolyzing cellulose. Unit components of a merely hydrolyzed cellulose are rod-like particles, not fibrous particles. This is described in detail in figures of page 23 of **attached** document "Microcrystalline Cellulose",

O.A.Batista, P.A.Smith, Industrial and Engineering Chemistry, 54(9), 20-29(1962)). This document is written by O.A. Batista, inventor of US Patent No. 3,146,168.

Thus, the particle size "less than one micron to about 300 microns" disclosed in **Batista** would mean a rod-like shape and a length/width ratio of less than 20. This "length/width ratio of less than 20" can be supported at Comparative Example 5 of the present specification in which "Ceolus Cream" was prepared by the following procedures (1) to (3).

(1) Hydrolyzing raw material pulp.

(2) Washing with water. (Wet crystalline cellulose is prepared.)

(3) Triturating (grinding) by a wet beads mill

In this connection, the material used in Comparative Example 5 of the present specification is a commercially available fine cellulose ("Ceolus Cream" FP-03, manufactured by Asahi Kasei Kabushiki Kaisha). The "fine cellulose" is crystalline cellulose fine particles uniformly dispersed in water and is a component having the best suspension stability taken from "crystalline cellulose aggregates".

As mentioned above, "crystalline cellulose (aggregates)" is obtained by "hydrolyzing raw material pulp and purifying with water". This is the material disclosed in the Batista article and the Batista patent. The Batista article shows a picture of fine particle components obtained by triturating (dispersing) the material. Therefore, the material used in Comparative Example 5 of the present specification corresponds to the material disclosed in the Batista article and the Batista patent.

Additionally, as understood by comparing Examples 20-27, which use 0.05 % of the cellulose described in the application, with Comparative Example 4, which uses rod-like particles (see page 91, line 9 to page 92, line 8 of the specification), the cellulose of Examples 20-27 had better suspension stability.

As mentioned above, the cellulose disclosed in **Batista** has a particle shape completely different from that of the cellulose of the claim 1 and cannot attain a good suspension stability which can be obtained in the present invention, when blended into the food product (for example, cocoa beverage).

3. Arguments against **Koch et al.**

Koch et al. discloses that it is effective to pre-treat a cellulose raw material having a crystallinity greater than 80 % with a specific enzyme for efficiently preparing cellulose derivatives (hydroxypropyl cellulose).

However, except for the crystallinity, none of the other claimed features are disclosed in **Koch et al.** Additionally, the purpose of **Koch et al.** is completely different from that of the present invention. Thus, a person having ordinary skill in the art would not have been motivated to pick the selected disclosure of crystallinity from **Koch et al**. Moreover, one having ordinary skill in the art would not have combined the **Koch et al.** crystallinity with other references.

4. Arguments against **Bunick et al.**

Bunick et al. discloses "cellulose composed of fibers in width from about 0.005 to 0.35 mm (5000 nm to 350,000 nm) and in length from about 0.001 to 4 mm (1μm to 4000μm)."

The length disclosed in **Bunick et al.** is partly overlapped with the length of the present invention, but the width disclosed in **Bunick et al.** is beyond the width of the present invention.

Bunick et al discloses that "Food grade cellulose is made by the controlled hydrolysis of crude cellulose"(see column 5, lines 42-43).

Cellulose materials made by hydrolysis are, as described in **Batista**, rod shaped, not microfibrillated, as mentioned above.

Bunick et al. merely discloses minute to larger particles in terms of length and width (for example, from small particles having a width 0.005 mm - length 0.001 mm to larger particles having a width 0.35 mm -length 4 mm). Even if **Bunick et al.** accidentally discloses a L/D ratio which overlaps the present invention, this does not mean that **Bunick et al.** suggests "microfibrillated cellulose".

5. Arguments against the 7th paragraph of Item 5 of the Office Action.

The Examiner asserts that one of ordinary skill in this art would be motivated combine the teaching of the **Turbak et al** and **Batista** patents with the teaching of the **Koch et al** publication, the **Bunick et al** patent and **Kajita et al.** (JP 52013713) since each of the documents disclose industrial application for cellulose products.

However, even if the **Turbak et al**, **Batista**, **Koch et al.**, **Bunick et al.** and **Kajita et al.** references disclose industrial applications for cellulose products, a person having ordinary skill in the art would not have been motivated to combine the **Turbak et al.**, **Batista**, **Koch et al.**,

Bunick et al. and **Kajita et al.** references. This is because the references having very different purposes and different uses from one another.

Additionally, even if a person having ordinary skill in the art would have been motivated to combine the **Turbak et al**, **Batista**, **Koch et al.**, **Bunick et al.** and **Kajita et al.** references with one another, the references do not disclose and/or suggest the microfibrillated cellulose of the present invention and thus the present invention is non-obvious in view of the **Turbak et al.**, **Batista**, **Koch et al.**, **Bunick et al.** and **Kajita et al.** references.

6. Arguments against 8th paragraph under Item 5 of the Office Action.

As mentioned above, none of the references disclose the feature of the present invention "the water-dispersible cellulose comprising 30% by weight or more of a component stably suspensible in water."

The cellulose disclosed in **Batista** has a shape different from that of the present invention. First of all, the disclosure "93% alpha cellulose" of **Batista** pointed out by the Examiner is outside the requirements of the present invention.

Additionally, even if **Koch et al.** disclosed cellulose having a crystallinity greater than 80 %, **Koch et al.** does not disclose any feature of the present invention except for crystallinity.

Thus, Applicants believe that the present invention would not have been obvious over these references.

7. Conclusion (Summary)

The cellulose disclosed in **Turbak et al.** has a thicker fiber than the microfibrillated cellulose of the present invention and has a state of an entanglement between fibers and a remarkably poor suspension stability in water. Also the cellulose disclosed in **Batista** is not a microfibrillated one.

Although **Koch et al.** disclose a crystallinity and **Bunick et al.** disclose a length and width of particles, neither **Koch et al.** nor **Bunick et al.** disclose any feature of the present invention except for it.

Thus, the present invention would not have been obvious over these references.

CONCLUSION

Thus, it is believed that all rejections have been removed, and the present application is

now in condition for allowance.

Reconsideration and early favorable action on the claims are earnestly solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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